

REMARKS

This Amendment is in response to the Office Action dated June 6, 2001. Claims 1-26 are pending in the present application. Applicant has amended claims 6 and 13, and added claim 26. Applicant has also amended the abstract and the drawings of the specification. Consequently, claims 1-26 remain pending in the present application.

In the above-identified Office Action, the Examiner objected to the Abstract and the drawings. Applicant has amended the Abstract to address the Examiner's objection. Applicant has amended the drawings to remove characters " ' " and " " " from the designation of connector 40 in figures 5(b) and 5(c) of the specification. Applicant has also amended figure 5(b) to change the designation for the LED from "42" to "32." Accordingly, Applicant's drawings, as amended, comply with 37 C.F.R. 1.84(p)(4).

Claim 6 has been amended to remove the term "backside," and substitute the term "socket-opposing side." Support for this amendment can be found in figures 5(a) thru 5(d) of the specification. Claim 13 has been amended to recite that either the removable visual indication structure or an alternate removable structure are coupled in an interchangeable manner to the at least one pin that is coupled to the printed circuit board. Claim 26 has been added to recite that the alternate removable structure of claim 13 is a flat ribbon cable connector. Support for amended claim 13 and new claim 26 can be found in the specification, page 6, lines 6-10. Accordingly, Applicant respectfully submits that no new matter is added.

In the above-identified Office Action, the Examiner rejected claim 6 under 35 U.S.C. § 112 as being indefinite because of the use of the term “backside.” Applicant has amended claim 6 to recite a “socket-opposing side.” The socket-opposing side can be viewed in Figures 5(a)-5(d) of the present application. Consequently, Applicant respectfully submits that claim 6 is clear and definite.

In the above-identified Office Action, the Examiner rejected claims 1-4, 7-10, and 13-17 under 35 U.S.C. § 102(b) as being anticipated by Yagi (U.S. 4,667,270). The Examiner rejected claims 5-6, 11-12, 18-19, and 20-25 under 35 U.S.C. § 103(a) as being unpatentable over Yagi. Applicant respectfully traverses the Examiner’s rejections.

The Examiner rejected claims 1-4, 7-10 and 13-17 as being anticipated by Yagi. In so doing, the Examiner cited Yagi, Figure 1 as teaching the elements recited in claims 1-4, 7-10, and 13-17.

Applicant respectfully disagrees with the Examiner’s rejection. Claim 1 recites, “A removable visual indication structure comprising: a removable connection portion; and a visual indication portion coupled to the removable connection portion, wherein the visual indication structure can be removably attached to a printed circuit board.” Independent claims 7, 13, and 20 recite use, system and method claims, respectively, that are analogous to claim 1.

Figure 6 depicts an embodiment of the structure in accordance with the present invention as recited in claims 1, 7, 13 and 20. Elements 50, 52, 54, and 56 depict embodiments of the “removable visual indication structure.” Element 34 of figure 4(b) depicts an embodiment of the “removable connection portion.” In addition, figure 5(c) depicts an embodiment of the bottom view of the “removable connection portion.” Embodiments of the “visual indication structure” are

shown in elements 32 and 42 of figures 4(b) and 5(b) respectively. Figure 5(d) depicts an embodiment of the “visual indication portion coupled to the removable connection portion.” Figure 6 depicts embodiments of the “visual indication structure” . . . “removably attached to a printed circuit board.” Element 50 depicts an embodiment of the “visual indication structure” in the removed state, whereas elements 52, 54, and 56 depict embodiments of the attached state. Using the removable visual indication structure recited in claims 1, 7, 13 and 20, printed circuit board space is freed for other uses because permanently attached LEDs are no longer needed. Specification, page 6, lines 11-15 and Figure 1.

The Examiner cites Yagi’s holder 18 as disclosing the “removable connection portion” of the “removable visual indication structure” that “can be removably attached to a printed circuit board.” However, Yagi neither teaches nor suggests a removable visual indication structure for a printed circuit board including a removable connection portion that can be removably attached to a printed circuit board as recited in claims 1, 7, 13 and 20. Rather than relating to a removable visual indication structure for a printed circuit board as in the present invention, Yagi “relates to an LED holder for fixing a light emitting diode” Yagi, col. 1, lines 6-7 (emphasis added).

Yagi discloses an LED holder “normally fixed on a circuit board” (column 3, line 32). In describing the attachment of the LED holder to the circuit board Yagi discloses fixing the holder “on a circuit board 36 by fitting the legs 32 of the holder in predetermined mounting holes 37, stopping the locking projection 34 against the rear side of the circuit board” (column 3, lines 31-35). Yagi claims this locking projection as “a second locking projection provided at a distal end of each leg portion for locking engagement in a circuit board” (claim1(g)). Yagi’s Figure 1, further depicts

the physical structure of the locking projection 34 that enables fixing the holder 18 to the printed circuit board 36.

Thus, Yagi discloses an LED holder “locked” into place on a printed circuit board, never discussing that the holder is either “removable” or “removably attached” as recited in claims 1, 7, 13 and 20. Moreover, one of ordinary skill in the art would not understand the LED structure disclosed in Yagi’s figures to be easily removable once fixed to the circuit board. Yagi makes no new disclosure to alter this understanding. Yagi’s LED unit depicted in Figure 1 contains external lead wires 20, which pass through a pair of lead wires holes 50 in the holder into sockets 51 in the printed circuit board. One of ordinary skill in the art would understand these lead wires to typically extend through to the opposite side of the circuit board where the circuit board traces would be located. To ensure a good electrical connection, one of ordinary skill in the art would understand these leads to be commonly soldered to the sockets in the printed circuit board. As such, removal of the LED holder would first require removal of the solder, then removal of the holder by a method undisclosed in Yagi. Consequently, the LED would not be removably attached to the circuit board.

Based on the foregoing, Yagi does not teach or suggest a removable visual indication structure as claimed in claims 1, 7, 13, and 20. Yagi’s LED holder is not removable or removably attached in the same sense as claimed in the present invention. Claim 1 recites the use of a removable connection portion and a visual indication portion coupled to the removable connection portion, wherein the visual indication structure can be removably attached to a printed circuit board. For example, the removable visual indication structures could include sockets, which are removably

attachable to the plurality of header pins located on the printed circuit board (page 5, lines 16-18, and figure 6). Yagi does not teach or suggest such a removable visual indication structure. Instead, Yagi discloses a “locking” holder for an LED, failing to disclose a “removable visual indication structure,” and as understood by one of ordinary skill in the art, discloses LEDs typically fixed to sockets in the circuit board via solder. For these reasons, Yagi’s LED holder, as disclosed, is not removable or removably attached to the extent claimed in the present invention. Accordingly, Applicant respectfully submits that claims 1, 7, 13 and 20 are allowable over the cited references.

Claims 2-6 depend upon independent claim 1. Claims 8-10 depend upon independent claim 7. Claims 13-17 depend upon independent claim 12. Thus, the foregoing arguments apply in full force to dependent claims 2-6, 8-10, and 13-17. In addition, claims 3, 4, 9, 10, 16, and 17 are separately allowable.

Claims 3, 9 and 16 claim either a structure or a system wherein the “LED comprises a surface mount LED.” Similarly, claims 4, 10, and 17 claim either a structure or a system wherein either the “removable connection portion” or the “removable connector” comprise “a surface mount connector.” With respect to claims 3, 9, and 16 the Examiner cites Figure 1, element 10 of Yagi as disclosing a “surface mount LED.” In addition, with respect to claims 4, 10, 17, the Examiner cites Figure 1, element 18 of Yagi as disclosing a “surface mount connector.”

Applicant respectfully disagrees. Neither the LED unit 10, nor the LED holder 18 disclosed in Figure 1 of Yagi are either “a surface mount LED” or “a surface mount connector” as understood by one of ordinary skill in the art. The Figure 4(b) of the present application depicts embodiments of both a surface mount LED 32, and a surface mount connector 34. As understood by one of

ordinary skill in the art, a surface mount LED does not have external lead wires 20. Similarly, as understood by one of ordinary skill in the art, a surface mount connector does not have legs 32 with locking projections 34 as shown in Yagi, Figure 1. Yagi's LED is a lead-type LED, which, as understood by one of ordinary skill in the art, commonly penetrates through to the circuit board's opposite side. This lead-type component is commonly used on printed circuit boards where the components typically reside on one side of the circuit board and the printed circuit traces typically reside on the opposing side. As understood by one of ordinary skill in the art, electrical connections of surface mount devices do not penetrate the device being connected to. One benefit of surface mount technology is to facilitate fabrication of circuit boards containing electrical devices and traces on both sides of a circuit board.

Based on the foregoing, Yagi does not teach or suggest either a surface mount LED or a surface mount connector as claimed in claims 3, 4, 9, 10, 16, and 17. For this reason, claims 3, 4, 9, 10, 16, and 17 are separately allowable over the cited references.

The Examiner rejected claims 5-6, 11-12, 18-19, and 20-25 as being obvious over Yagi. Claims 5-6, 11-12 and 18-19 depend upon claims 1, 7, 13 and 20, respectively. Consequently, the arguments herein apply with full force to claims 5-6, 11-12 and 18-19. Accordingly, Applicant respectfully submits that claims 5-6, 11-12, and 18-19 are allowable over the cited references.

Claims 5-6, 11-12 and 18-19 are also separately allowable over the cited references. Claims 5, 11, and 18 recite a removable visual indication structure "wherein the LED is soldered to the surface mount connector." Similarly, claims 6, 12, and 19 as amended recite a removable visual indication structure "wherein the wherein the LED is soldered to the socket-opposing side of the

surface mount connector.” The foregoing argument relating to surface-mount connections thus apply in full-force to claims 5-6, 11-12, and 18-19. For this reason, the Examiner’s application of Howard v. Detroit Stove Works, 150 U.S. 164 (1893), that “it involves no invention to cast in one piece an article which has formerly been cast in two pieces and put together”, is inapplicable. Because Yagi discloses neither a surface mount LED, nor a surface mount connector, Yagi neither teaches nor suggests casting the LED and surface mount connector together. Accordingly, Applicant respectfully submits that claims 5, 6, 11, 12, 18 and 19 are separately allowable over the cited references.

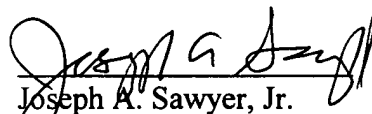
The Examiner rejected method claims 20-25 as being obvious in view of the Examiners citations to Yagi in the anticipation rejection of claims 1-4, 7-10, and 13-17 of the present invention’s visual indication structure for a printed circuit board. Because claims 20-25 are a method of fabricating the visual indication structure, the foregoing arguments relating claims 1-4, 7-10, and 13-17 apply in full force to claims 20-25. Because Yagi does not teach or suggest the visual indication structure, the method for fabricating such structure is not obvious in view of Yagi. Accordingly, Applicant respectfully submits that claims 20-25 are allowable over the cited references.

In view of the foregoing, it is submitted that Applicant’s claims 1-26 are patentable over the cited reference and are in condition for allowance. Reconsideration of the rejections and objections is requested.

Attached hereto and captioned “Version with Markings to Show Changes Made” is a marked-up version of the changes made to the abstract by the current amendment.

Applicant's attorney believes that this application is in condition for allowance. Should any unresolved issues remain, Examiner is invited to call Applicant's attorney at the telephone number indicated below.

Respectfully submitted,


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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

ABSTRACT

In a first aspect [of the present invention], a removable visual indication structure is disclosed. The removable visual indication structure [in accordance with the present invention comprises] includes a removable connection portion and a visual indication portion coupled to the removable connection portion wherein the visual indication structure can be removably attached to a printed circuit board. In a second aspect [of the present invention], a printed circuit board system is disclosed. The system [in accordance with the present invention comprises] includes a printed circuit board, at least one pin coupled to the printed circuit board, and at least one removable visual indication structure coupled to the at least one pin. In yet a third aspect [of the present invention], a method for fabricating a removable visual indication structure is disclosed. The method [in accordance with the present invention comprises the steps of] includes providing at least one visual indicator, providing a removable connector adapted to be coupled to the printed circuit board, and coupling the at least one visual indicator to the removable connector. Accordingly, the [present invention] method and system provides a simple and cost effective way for manufacturers to provide visual indicators to various types of systems while at the same time increasing the amount of space available on the printed circuit board.

IN THE CLAIMS:

6. (Amended) The removable visual indication structure of claim 5 wherein the LED is soldered to [the backside] a socket-opposing side of the surface mount connector.

13. (Amended) A printed circuit board system comprising;
a printed circuit board;
at least one pin coupled to the printed circuit board; and
either at least one removable visual indication structure or an alternate removable structure
interchangeably coupled to the at least one pin.

Please add claim:

26. The system of claim 13 wherein the alternate removable structure is a flat ribbon cable connector.